

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Ball Check Valve for Pressurized Gas Containers

I, KARL HORST KNOPF, of German Nationality, of No. 26, Mittelstrasse, Solingen-Ohligs, Germany, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to valves, and more specifically to a ball check valve for use with pressurized gas containers.

Such ball check valves are for instance used with so-called gas-dispensing cartridges or capsules which serve to pressurize a liquid, e.g. a spirituous drink, so as to render it ready for pouring out.

The hitherto known ball check valves do not permit, on opening the valve, to throttle down a great pressure to a minimum because on opening the valve, as experience has taught, an excessive cross-sectional area of flow will result. A throttling of the pressure, however, is requisite to the pouring out of drinks as otherwise the liquor when being dispensed from its container would splash or spatter and would thus not, for example, be poured out as a pressure-controlled jet into a glass.

It is the object of this invention to eliminate the aforementioned drawback.

According to the present invention, a ball check valve for containers for pressurized liquids having a ball-shaped valve shutter member automatically closing due to the internal pressure, said valve shutter member being reciprocable in a longitudinal channel of a sleeve, said channel gradually tapering towards the valve seat, is provided wherein the sleeve is made of elastic material and the walls of the longitudinal channel of the sleeve from their narrowest point to their broadest point enclose the ball on all sides in any position of the ball with more or less clamping pressure for a throttled and regulatable discharge of liquid from the container, so that the contents of the container, when the ball is urged away from its seat, passes the ball by enlarging

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the channel of the elastic sleeve and in so doing is more or less throttled depending upon the position of the ball in the conical channel.

Owing to the ball being held in the throttling channel by the resilience of the sleeve, only the least possible quantity of gas is allowed to escape from the pressurized gas container when the valve ball is urged away from its seat by known manually actuated means such as a tappet.

An important feature of the invention consists in that the throttling channel of the ball check valve conically widens in the direction of the foot portion of the valve body.

This construction of the throttling channel permits, on opening the valve, a regulation (which may be manual) of the quantity of gas to be discharged because the amount of frictional engagement with which the ball of the valve is clampingly held by the elastic wall of the throttling channel progressively increases as the ball moves in the direction of the valve seat and progressively decreases in the direction of the throttling channel end remote from the valve seat. Hence it follows that when the ball is urged away from its valve seat, the throttling of the gas pressure will decrease as the frictional engagement of the ball by the elastic wall of the throttling channel decreases whereas, with the pressure on the ball increasing as it moves in the direction of the valve seat, the throttling of the gas pressure will increase as the frictional engagement of the ball by the elastic wall of the throttling channel progressively increases until the ball engages the valve seat and the valve is completely closed.

Two preferred embodiments of the invention are hereinafter particularly described, by way of example, with reference to the accompanying drawings, wherein:—

Fig. 1 is an elevational view, partly in section, of a ball check valve screwed onto a pressurized fluid container;

Fig. 2 is a longitudinal section, on an en-

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larged scale, through the ball check valve, and Fig. 3 is a longitudinal section through another form of construction of the ball check valve.

5 In Figs. 1 and 2 of the drawing a ball check valve is shown which consists of an elastic valve body 1 forming a sleeve and having an upper substantially closed head portion and a lower open foot portion. A central cylindrical nozzle 2 extends through the head portion, through which nozzle, on the one hand, pressurized gas can be filled into a pressurized fluid container 3 and, on the other hand, a throttled flow of gas can be dispensed from said pressurized fluid container 3. The nozzle 2 merges into a throttling channel 4 in which a valve ball 5 is guided. The throttling channel 4 conically widens in the direction of the foot portion of the valve body 1 and merges into a frusto-conical hollow space 6 which is open at the bottom of the valve body 1. Between the nozzle 2 and the throttling channel 4 there is located a valve seat 7 for the valve ball 5. The valve ball 5 bears against the seat 7 when the valve is closed and thus tightly seals the nozzle 2. A disc 8 provided with apertures 9 engages in an annular groove 10 formed in the inner wall of the hollow space 6. As the pressurized fluid container 3 is being filled with gas, the valve ball 5 will be urged against the disc 8 whereby the gas is allowed to enter the pressurized fluid container 3 by passing through the apertures 9. The valve body 1 is firmly enclosed by a cap 11 which has an internal screw thread 13 at its lower end. By means of this screw thread 13 the cap 11 accommodating the valve body 1 can be screwed onto the pressurized fluid container 3 which is provided with a correspondingly screw threaded neck 12. The cap 11 has an upper closed head portion in which an outwardly widening passage 14 is provided which has a width corresponding to that of the nozzle 2.

45 In Fig. 3 a modified form of construction of a ball check valve is shown which comprises a valve body 1', which contrary to that shown

in Figs. 1 and 2, is made of rigid material, whereas the throttling channel 4 consists of an initially separated sleeve 15 of elastic material firmly fitted in the valve body 1'. 50

WHAT I CLAIM IS:—

1. A ball check valve for containers for pressurized liquids having a ball-shaped valve shutter member automatically closing due to the internal pressure, said valve shutter member being reciprocable in a longitudinal channel of a sleeve, said channel gradually tapering towards the valve seat, wherein the sleeve is made of elastic material and the walls of the longitudinal channel of the sleeve from their narrowest point to their broadest point enclose the ball on all sides in any position of the ball with more or less clamping pressure for a throttled and regulatable discharge of liquid from the container, so that the contents of the container, when the ball is urged away from its seat, passes the ball by enlarging the channel of the elastic sleeve and in so doing is more or less throttled depending upon the position of the ball in the conical channel. 55

2. A valve, as claimed in claim 1, wherein said sleeve is provided with a frusto-conical channel widening towards the base thereof and connecting at its upper end with said longitudinal channel. 60

3. A valve, as claimed in either of claims 1 or 2, wherein the sleeve is formed as an insert in a valve body and is made of elastic material. 65

4. A valve, as claimed in either of claims 1 or 2, wherein the sleeve is formed as an insert in a valve body made of a rigid material. 70

5. A ball check valve for containers constructed and arranged substantially as hereinbefore described with reference to either of the embodiments illustrated in the accompanying drawings. 75

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COMPLETE SPECIFICATION

1 SHEET

This drawing is a reproduction of the Original on a reduced scale

Fig. 1

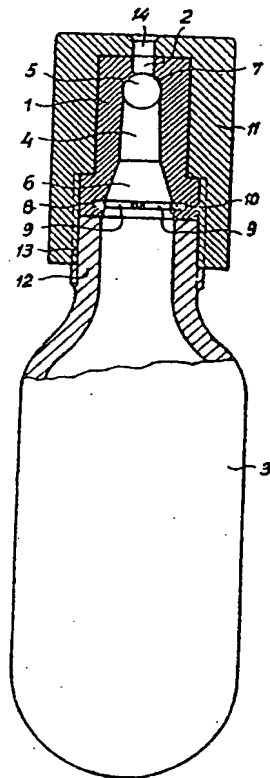


Fig. 2

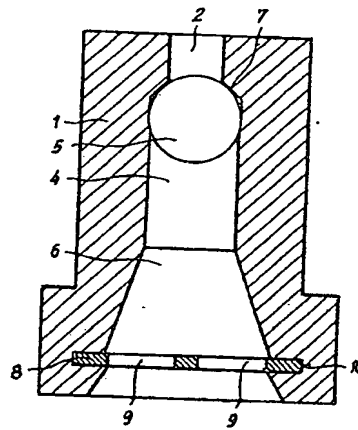


Fig. 3

